ENTOMOLOGY.—*Gall midges associated with cones of western forest trees* (*Diptera: Itonididae*). RICHARD H. FOOTE, Entomology Research Branch, United States Department of Agriculture.

For a number of years, personnel of the former Bureau of Entomology and Plant Quarantine, now of the U. S. Forest Service, U. S. Department of Agriculture, have been studying all phases of the biology and control of forest insects. An extensive collection of gall midges, together with associated biological data, has accumuluated during this investigation and has recently been made available to me. The present paper provides names and descriptions for a number of species occurring in cones and seeds of western conifers; their biological characteristics will be published in a forthcoming manual of the insects associated with these trees in western United States.

Throughout the work I have omitted morphological descriptions of immature stages. Almost without exception, larvae in this collection were so poorly mounted that detailed examination under a compound microscope was not possible. Even in those few cases in which most larval characters were visible, I have preferred to postpone publication of descriptions until concepts of species differences in the larval stage have been clarified. Associations of larva and adults have been made largely on the basis of the available biological information, aided in a few cases by incomplete morphological details.

I wish to thank F. P. Keen, California Forest and Range Experiment Station, for making this collection of gall midges available to me and for encouraging my efforts. I am also grateful to Dr. A. Earl Pritchard, University of California, for making preliminary identifications of a number of the species included herein.

Specimens deposited in the U. S. National Museum are indicated below by the initials USNM; those in the California Insect Survey at Berkeley by CIS.

Genus **Rübsaamenia** Kieffer

Rübsaamenia Kieffer, 1894, Ann. Soc. Ent. France **63**: 333 (type, *Asynapta pectoralis* Winnertz; by original designation); 1913, Gen. Ins., fasc. 152: 278; Felt, 1911, Journ. New York Ent. Soc. **19**: 40; 1916, New York State Mus. Bull. 180: 129; 1925, New York State Mus. Bull. **257**: 140.

To my knowledge no previous mention of the occurrence of this genus in North America has been made. The species assigned to it may be recognized by the presence of the base of vein Cu_1 (this vein obsolete basally in the closely related North American genus *Holoneurus*) and by the long slender recurved abdomen, which separates it from the North American genera *Asynapta* and *Clinorhytis*. *Rübsaamenia* runs to *Porricondyla* in Pritchard's (1953) key to California genera of Porricondylini; it may be separated from that genus by the recurved abdomen and by the fact that vein Cu_1 is present to the base of the wing. It is represented in the United States by the single species described below.

Rübsaamenia keeni, n. sp.

Fig. 1, a–g

Male.—Head as wide as high from anterior view, eye bridge about 12 facets wide. Scape of antenna subtriangular, length about 2.5 times width at apex; pedicel roughly rectangular, 0.7 as wide as apex of scape, not narrowed apically; flagellum with 12 to 24 segments, those of the smallest individuals with the fewest segments, segments decreasing in length from base to tip, apical segment 1.5 times as long as subapical and narrowed to a blunt point at apex; fifth flagellar segment (fig. 1*g*) 2.0 times as long as wide; stem with subapical expansion, equal in length to node, which is as wide as long, slightly narrower at base than at tip; circumfilum a simple, tightly fitting ring encircling node at proximal third. Palpus (Fig. 1*c*) of four segments, proportions 1:1.2:2.1:3 (average of type series); second segment widest, third and fourth successively narrower; setae longer than width of third. Wing (Fig. 1*b*) 2.3 times as long as wide; membrane with fine microtrichia; R_1 ending in costa at basal 0.4; R_s nearly parallel with costa; R_5 bending posteriorly to meet and terminate costa at or very slightly before wing tip; M_{3+4} visible from wing base to margin; Cu_2 terminating at middle of posterior margin of wing. Hind femur slightly longer than tibia; first tarsal segment with a short, blunt apicolateral projection on all legs; proportions of hind tarsal segments 1:8.3:4.6:2.6:1.4 (average of type series); fore, mid, and hind claws (Fig. 1*d*) each with a long basal tooth; each pulvillus very slightly shorter, equal to, or slightly longer than claw. Terminalia (Fig. 1*a*) longer than wide (viewed dorsally); length of basistyle about 2.3 times its greatest width, with an inner apical lobe obscured in some mounts by the dististyle; inner surface of lobe covered by a patch of short, slender spines; dististyle 2.0 times as long as wide at base, bluntly rounded distally, with an even, dense row of blunt, stout spines along distal third or fourth of inner margin, this comb terminated by two heavy, blunt teeth at apex. Tenth sternite and tenth tergite bilobed, the former distinctly shorter than the latter and less deeply incised at center line; aedeagus truncate, with a shallow central notch and a small projection on distal margin midway between central incisure and lateral margin; proximally, aedeagus with a curved arm on each side connecting with the basistyle, and a slender median arm tapering to a sharp point, on each side of which there is connected an irregular, sac-shaped structure.

Female.—Head, eye bridge, scape, and pedicel as in male. Flagellum with 10 to 26 segments, the smallest individuals with the fewest segments; first flagellar segment longest, remaining segments decreasing in length from base to tip, apical segment somewhat elongated and narrowed to blunt apical point. Fifth flagellar segment (Fig. 1*f*) with node 1.3 times as long as wide; stem short, 0.25 as long as node; circumfilum a simple, tightly fitting ring as in male, encircling middle of node. Palpus of four segments, proportions 1:1.3:2.6:3.3 (average of type series), similar in general appearance to that of male. Wing and legs as in male. Terminal abdominal segment (Fig. 1*e*) with paired, elongate appendages, each about 2.5 to 3.0 times as long as wide; in addition, a flat, bilobed plate nearly covering basal half of each appendage and attached thereto, similar in shape to tenth sternite of male; a sclerotized internal spermatheca with paired lateral arms also present.

Holotype.—♂, Butte County, Calif, 29-IX to 7-X, 1953, Calif. Div. Forestry, reared from cones of *Abies magnifica*, Hopkins no. 32738e. U.S.N.M. no. 63027.

Paratypes.—7 ♂♂, 14 ♀♀, same data as holotype, Hopkins nos. 32737, 32737e and 32737h. 3 ♂♂, 3 ♀♀ (CIS); remainder (USNM).

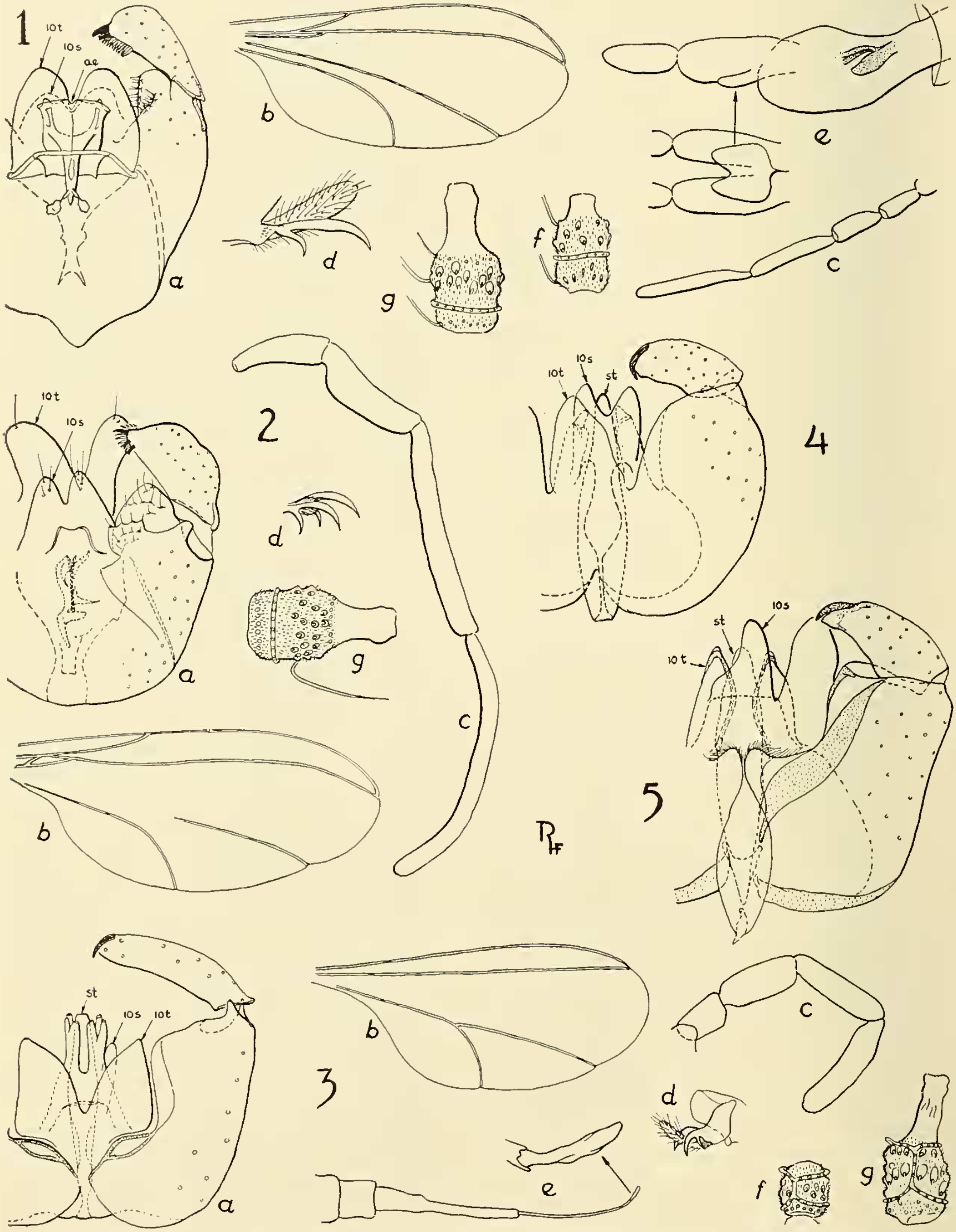
Additional material examined.—CALIFORNIA: 24 ♂♂, 44 ♀♀, 38 larvae; Crescent City, Gasquets, General Grant National Park, Kyburz, McKinney Creek, Mono National Forest, Sequoia National Park, Mount Shasta City, Six Rivers National Forest, Yosemite National Park. COLORADO: 2 ♀♀, 18 larvae; Cheyenne Mountain, N. Cheyenne Canyon, Manitou, Williams Canyon. NEW MEXICO: 3 ♂♂; Pecos Mountains. OREGON: 65 ♂♂, 61 ♀♀, 50 larvae; Ashland, near Lamb's Mine (Ashland), Clover Creek, Colestin, Jenny Creek, La Pine, Netart's Beach, Palmerlee's Ranch, Waldo. Taken from cones of *Abies concolor*, *A. grandis*, *A. magnifica shastensis*, *Picea englemanni*, *P. contorta* var. *latifolia*, *Pinus jeffreyi*, *P. lambertiana*, *P. ponderosa*, *P. ponderosa* var. *scopulorum*, *Pseudotsuga menziesii*, and *P.* sp. from February 17 to November 26, 1913–1954.

Discussion.—This species may be distinguished from all other members of the Porricondylini by the generic characters given above, and by the characteristic features of the male terminalia (Fig. 1*a*).

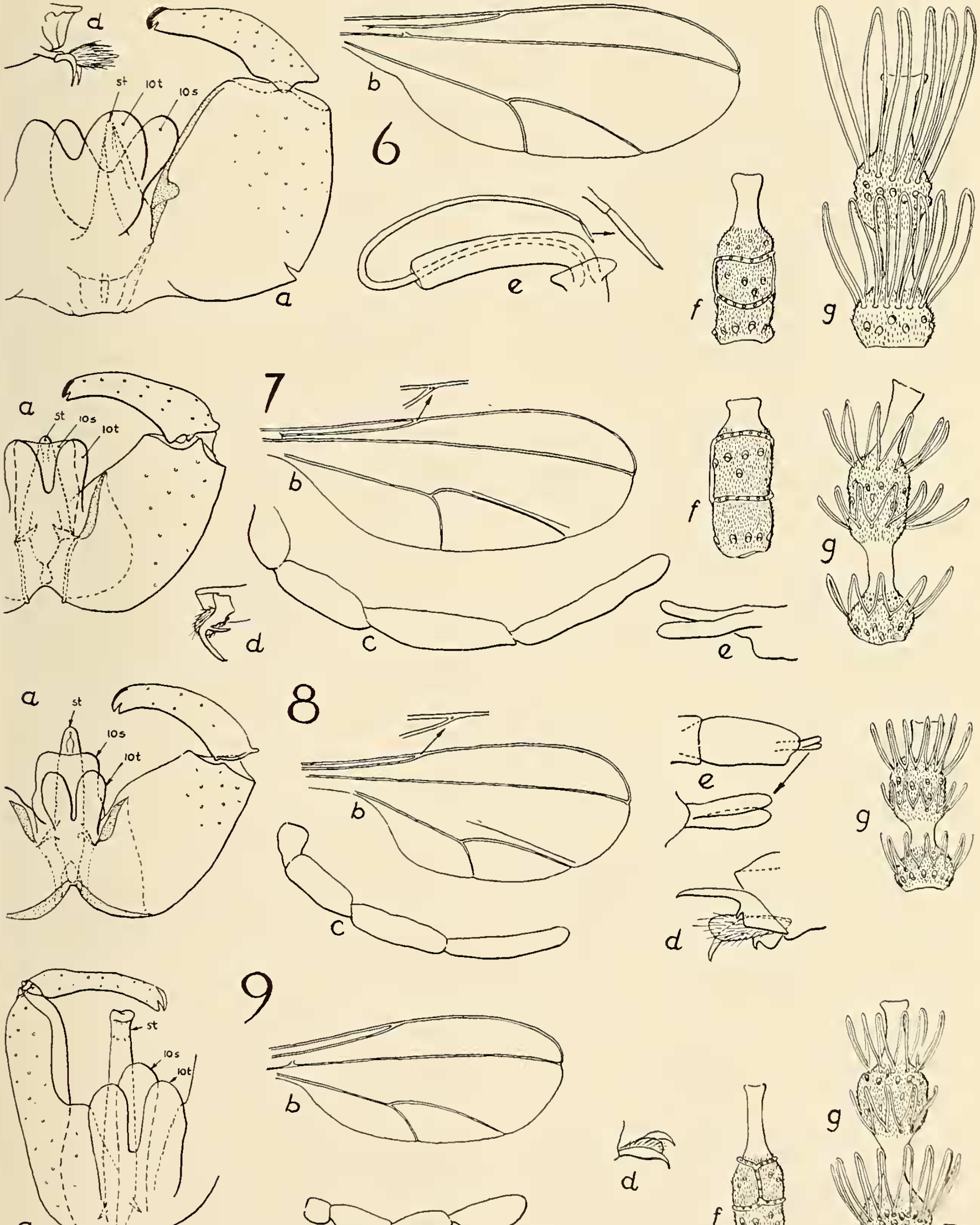
Holoneurus strobilophilus, n. sp.

Fig. 2, a–d, g

Male.—Head as wide as high from anterior view, eye bridge 8 to 10 facets wide. Scape of antenna subtriangular, length about equal to width at apex; pedicel subglobular, as wide as long and about 0.7 as wide as apex of scape; flagellum of 21 or 22 segments, which decrease only very slightly in length and width from base to apex; terminal segment longer than subterminal, with the apical nipple; fifth flagellar segment (Fig. 2*g*) with a proximal node 1.2 times as long as greatest width and a distal stem 0.7 as long as node; circumfilum a simple, closely fitting ring encircling node at proximal third. Palpus (Fig. 2*c*) of four segments, proportions 1:1.4:2.4:3.3 (holotype only), second segment widest, third and fourth progressively narrower, setae short and scattered. Wing (Fig. 2*b*) 2.3 times as long as wide, R_1 ending in costa at basal 0.4; R_s nearly parallel with costa and appearing to be a continuation of R_5; R_5 bending posteriorly to meet and terminate costa slightly before wing tip; M_{3+4} straight except at extreme apex, visible to base of wing; Cu_2 curved to meet posterior wing margin at basal 0.45 of wing. Hind femur slightly longer than tibia; proportions of hind tarsal segments 1:8.0:5.0:2.5:1.2 (one leg of holotype only); fore, mid and hind claws each with a long basal tooth; each pulvillus about 0.5 as long as claw. Terminalia (Fig. 2*a*) slightly longer than wide



FIGS. 1–5.—1, *Rubsaamenia keeni*, n. sp.; 2, *Holoneurus strobilophilus*, n. sp.; 3, *Dasyneura abiesemia*, n. sp.; 4, *Phytophaga carpoghaga*, Tripp, male terminalia; 5, *Janetiella siskiyou* Felt, male terminalia. (a, male terminalia; *b*, wing; *c*, male palpus; *d*, hind claw, male; *e*, terminal segments of female ovipositor; *f*, fifth flagellar segment, female; *g*, fifth flagellar segment, male. Abbreviations: 10t = tenth tergite; 10s = tenth tergite; ae = aedeagus; st = style.)



Figs. 6–9.—6, *Contarinia oregonensis*, n. sp.; 7, *Mycodiplosis conicola*, n. sp.; 8, *Mycodiplosis coryloides*. n. sp.; 9, *Lestodiplosis taxiconis*, n. sp.; (*a*, male terminalia; *b*, wing; *c*, male palpus; *d*, hind claw, male; *e*, terminal segments of female ovipositor; *f*, fifth flagellar segment, female; *g*, fifth flagellar segment, male. Abbreviations: 10t = tenth tergite; 10s = tenth sternite; st = style.)

(viewed dorsally); length of basistyle about 2.0 times its greatest width, with a rounded inner apical lobe and a truncate apical lobe ventral to it, both lobes noticeably more densely haired than basistyle itself; length of dististyle 2.1 times its greatest width, outer margin with a heavy subterminal seta, inner margin straight, an apical comb of many even, short spines and two or three longer stouter spines more widely spaced; style short, slender, rodlike; an irregularly shaped structure lying beneath and to one side of style, as if turned on its side as a result of slide mounting; tenth sternite bilobed, each lobe about as wide at base as high; tenth tergite bilobed, each lobe about 1.5 times as long as wide at base.

Female.—Unknown.

Holotype.—♂, Butte County, Calif., 29-IX to 7-X, 1953, Calif. Div. Forestry, reared from cones of *Abies magnifica*, Hopkins no. 32737. U.S.N.M. no. 63028.

Paratypes.—4 ♂♂, same data as holotype. 2 ♂♂ paratypes (CIS), remainder (USNM).

Additional material examined.—CALIFORNIA: 6 ♂♂, Sequoia National Park. OREGON: 1 ♂, Colestin. From cones of *Abies concolor*, August 22 to September 24, 1914.

Discussion.—Felt (1915) keys the North American species of *Holoneurus* principally by the use of color characters. The comparatively long distal narrowed portion of the fifth flagellar segment will separate *H. strobilophilus* from the only two species, *multinodus* Felt and *photophilus* Felt, possessing over 20 flagellar segments. The terminal armature of the dististyle (Fig. 2*a*) will further distinguish this species from others in the genus. The genus is not included in Pritchard's (1953) key; it runs to *Porricondyla* there, from which it may readily be distinguished by its simple vein Cu_2.

Dasyneura abiesemia, n. sp.

Fig. 3, a–g

Male.—Head suboval (viewed anteriorly), widest slightly below the center; eye bridge about eight facets wide. Scape of antenna nearly square in outline, very slightly longer than wide; pedicel similar in shape and very slightly smaller than scape; flagellum of undetermined number of segments, some of the distal ones lost, but those that are present not decreasing noticeably in length or width from base to apex of flagellum; first two flagellar segments completely fused; fifth flagellar segment (Fig. 3*g*) with proximal node 1.2 times as long as wide; distal stem 0.9 as long as node; circumfilum consisting of one irregular ring encircling node on basal third and another nearly at apex, these two rings connected on opposite sides of node by short extensions of the rings; the segment rather lopsided, with stem emerging more or less from one side of node apex, the circumfilum on the opposite side loosely applied to the segment and extending some distance away from its surface. Palpus (Fig. 3*c*) of four segments, proportions 1.0:1.5:1.9:2.2 (one palp only), proximal segment widest, other segments progressively narrower. Wing (Fig. 3*b*) 2.5 times as long as wide; R_1 close to costa and joining it at basal third, the entire area between costa and R_1 somewhat darker than remainder of wing; R_5 nearly straight, bending posteriorly only very slightly at outer fourth to meet and terminate costa distinctly proximad of wing tip, M_{3+4} not visible in slide mounts; Cu straight, branched distinctly apicad of juncture of R_1 with costa; Cu_1 as long as Cu, nearly straight; Cu_2 curved posteriorly and ending at middle of posterior margin of wing. Legs thickly set with narrow, pointed scales; hind tarsal segments shrunken in all slide mounts so that proportions are not measurable; claws (Fig. 3*d*) not bent at right angles; fore, mid and hind claws each with a long, narrow ventral tooth which is 1.5 to 1.75 times as long as claw. Terminalia (Fig. 3*a*) wider than long (viewed dorsally); basistyle 2.0 times as long as wide, with a prominent inner apical, broadly rounded prominence and a more proximal shoulder in which a darkened, ringlike structure appears; length of dististyle 4.0 times greatest width, narrowing gradually distally and tipped with a narrow, sclerotized plate which appears as spur in slide mounts; style widest at middle, narrowing slightly to a rounded-truncate tip distally and narrowing more strongly toward the base, which is provided with a foot-shaped expansion; style surrounded ventrally and laterally by a deeply incised plate with three short terminal appendages on each side; tenth sternite consisting of two extremely narrow, widely separated lobes, only one of which is shown in the figure; tenth tergite completely filling the space between inner borders of basistyle and about as long as these, the incision deeper than one-half the length of plate, each lobe gently, then more abruptly tapered on inner margin to a narrow, rounded point.

Female.—Head, eye bridge, scape, pedicel and first two flagellar segments as in male. Flagellum of 14 segments, the second segment the longest, the more distal segments becoming slightly narrower; fifth flagellar segment (Fig. 3*f*) 1.4 times as long as wide, with inconspicuous stem, circumfilum as in male. Wing, legs, claws, and pulvilli as in male, proportions of hind tarsal segments 1.0:8.0:4.2:2.4:1.3 (average of type series). Ovipositor (Fig. 3*e*) retractile, at least twice as long as abdomen when fully extended, terminated by a single lobe of variable shape about 6.0 times as long as wide.

Holotype.—♂, Palmerlee's Ranch, Oreg., 8-IX-1915, P. D. Sergent and J. E. Patterson, bred from cones of *Abies magnifica shastensis*, Hopkins no. 14200c. U.S.N.M. no. 63029.

Paratypes.—3♂♂, 4♀♀, same data as holotype. One ♂, 2♀♀ (CIS), remainder (USNM).

Additional material examined.—California: 5♂, 3♀, 56 larvae; Butte County, Crescent City, General Grant National Park, McKinney Creek, Sequoia National Park. Oregon: 3♂♂, 11♀♀, 7 larvae; Applegate River, Ashland, Colestin. Taken from cones of *Abies concolor*, *A. grandis*, *A. magnifica*, and *A. magnifica shastensis*, July 18 to October 7, 1914–1953.

Discussion.—Pritchard (1953) states that three species of *Dasyneura* occur in California; *D. abiesemia*, the fourth, is the only one forming gall pockets in seeds and cone scales of *Abies* in California forests. In Felt's (1915) key to United States species, it falls within the series having a nearly straight vein R_5 and 14 flagellar segments; within this group it is the only species in which the female has a nearly sessile, subglobular fifth flagellar segment, and in which the proportions of the palpal segments are as shown in Fig. 3*c*.

Phytophaga carpophaga Tripp

Fig. 4

Phytophaga carpophaga Tripp, 1955, Can. Ent. **87**: 261.

A comparison of males collected as shown in the "Material examined" section below with a male paratype of *carpophaga* sent to the National Museum by the Canadian Department of Agriculture leaves no doubt that *carpophaga* is represented on the west coast. Most of Tripp's material is from Ontario and was collected from white spruce, *Picea glauca*.

I am including an illustration (Fig. 4) of the male terminalia of this species drawn from a Colorado specimen, since Tripp's photograph omits certain details which may eventually become important for the separation of *carpophaga* from other members of the genus.

Material examined.—California: 9♂♂, 2♀♀, Crescent City. Colorado: 7♂♂, 2♀♀, 3 larvae, Glenwood Springs, Manitou, Mountain View. Taken from cones of *Picea englemanni* and *P. sitchensis*, August 17 to October 25, 1913–1916.

Janetiella siskiyou Felt

Fig. 5

Janetiella siskiyou Felt, 1917, Journ. New York Ent. Soc. **25**: 194; Pritchard, 1953, Bull. California Ins. Survey **2**(2): 139.

Felt originally described larvae and females from the Siskiyou National Forest in California; his description of the females is based primarily on color characters, but since this midge appears to be quite host-specific for seeds of *Chaemocyparis*, there appears to be no need to repeat Felt's information or to add to it here.

A description of the terminalia is given below. Unfortunately, the single male available to me had been hardened in alcohol for such a long period of time that the regular mounting method obscured much of the detail; remaining parts of this specimen were nearly destroyed in the mount. No recently collected material was available for this study.

Male.—Terminalia (Fig. 5) stout, slightly longer than wide (dorsal view). Basistyle with overall width equal to overall length, entire proximal margin and almost entire inner margin with broad sclerotized bands, a lobe at inner apex with a band of sclerotization at its own inner edge, and a narrowly pointed lobe attached to inner margin at widest portion of basistyle; length of dististyle about 2.1 times greatest width, both inner and outer margins gently curved from base to join each other at apex, here provided with a single sharp, stout tooth; style bluntly rounded distally and proximally, its center portion obscured in the mount, proximal portion with a subtriangular plate ending proximally in a broadened expansion resembling an arrow-head; tenth sternite bilobed, a deep incisure separating the broadly pointed lobes; tenth tergite with two medially expanded lobes which are lightly sclerotized on their inner margins and separated by a cleft, the bottom of which is not visible in the mount.

Material examined.—Oregon: 4♀♀, 1♂;

Siskiyou National Forest, Waldo. Taken from cones of *Chaemocyparis lawsoniana* March 28, 1919, and August 15, 1914.

Contarinia oregonensis, n. sp.

Fig. 6, a, b, d, e, f, g

Male.—Head 1.2 times as high as wide from anterior view; eye bridge 12 to 14 facets wide. Scape of antenna subtriangular, length equal to distal width; pedicel subglobular, length equal to greatest width, 0.6 to 0.7 as wide as apex of scape; flagellum of 12 segments, the first two fused, their point of junction indicated by a narrow hyaline area, remaining segments approximately equal in size, terminal segment with distal stem reduced to a short nipple; fifth flagellar segment (Fig. 6*g*) with two nodes, the proximal one 0.8 as long as the distal; length of proximal stem 1.1 times proximal node; length of distal stem equal to that of distal node; two series of circumfila, one on each node, the loops of that on proximal node attaining middle of distal node, those of distal node attaining middle of proximal node of succeeding segment. Palpus of four segments, proportions 1.0:1.5:2.5:2.8 (holotype only), the second segment widest, third and fourth successively narrower; with sparse, scattered setae longer than width of second segment. Wing (Fig. 6*b*) 2.5 times as long as wide; R_1 entering costa at basal 0.4; R_5 curving posteriorly at distal third to meet and terminate costa only very slightly before wing tip, with a cross vein at basal 0.12 extending halfway to R_1 and ending midway between the two veins; Cu straight; Cu_1 gently curved throughout its entire length; Cu_2 terminating in posterior border of wing just apicad of point of origin. Legs long; hind femur 1.1 times as long as tibia; proportions of hind tarsal segments not recognizable because of damage to specimens; fore, mid, and hind claws (Fig. 6*d*) simple, each shorter than the pulvillus. Terminalia (Fig. 6*a*) wider than long (viewed dorsally); length of basistyle 1.4 times its greatest width[1] with a dark, thickened sclerotized area at center of inner margin, no inner lobe present; length of dististyle 3.5 times its greatest width, with an inner, subterminal notch. Style 3.5 times as long as wide, bluntly pointed apically, with two ill-defined membranes nearly attaining tip of style and lying in a different position in each mount; tenth tergite bilobed, width of each lobe at base about equal to length; tenth sternite bilobed, with central incisure slightly deeper than that of tenth tergite, length of each lobe about 1.2 times proximal width; style and tergites terminating at approximately the same level.

Female.—Head, eye bridge, scape, pedicel and palpus similar to those of male. Flagellum of 12 subequal segments; first two segments fused, with a narrow hyaline area in some specimens indicating the juncture; fifth flagellar segment (Fig. 6*f*) with proximal node 2.0 times as long as wide; distal stem 0.5 as long as node; two irregular circumfila encircling node and connected at opposite sides of node as shown. Wing and legs as in male. Ovipositor (Fig. 6*e*) retractile, about 0.6 as long as abdomen, terminating in a lightly sclerotized lobe which is the side view of the scissorslike terminus of ovipositors usually found in this genus.

Holotype.—♂, Mistletoe, Oreg., 25-VIII-1916, P. D. Sergent and J. E. Patterson, reared from cones of *Pseudotsuga menziesii*, Hopkins no. 14280e. U.S.N.M. no. 63030.

Paratypes.—8 ♂♂, 10 ♀♀, same data as holotype. Three ♂♂, 5 ♀♀ paratypes (CIS), remainder (USNM).

Additional material examined.—4 ♂♂, 4 ♀♀, same data as holotype. (USNM). These badly damaged specimens have little value for comparative purposes.

Discussion.—Felt (1917) employs the color of live specimens and antennal characters for the separation of males but does not attempt to key females. This is the only species of *Contarinia* known to occur in the Western United States, and the only United States species associated with conifers. Antennal and palpal characters of *Contarinia oregonensis* closely resemble those of *C. perfoliata* Felt and *C. agrimoniae* Felt; characters of the male terminalia (Fig. 6*a*) will distinguish *oregonensis* from the other two. The genus, although previously recorded from California, will run in Pritchard's (1953) key to *Thecodiplosis*, but may be distinguished by the invagination of the wing margin at the termination of vein R_5.

Mycodiplosis conicola, n. sp.

Fig. 7, a–g

Male.—Head suboval from anterior view, widest slightly below center; eye bridge 8 to 10 facets wide. Scape of antenna subtriangular, length equal to greatest width; pedicel subglobular, as long as wide, the same width as scape;

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[1] In flattened-out holotype; other males in type series have shriveled basistyles.

flagellum of 12 segments, the first two completely fused with only a narrow subhyaline area indicating the junction, the remaining segments about the same length as the fifth but with narrower stems, twelfth segment with a long terminal nipple; fifth flagellar segment (Fig. 7*g*) with two nodes, the proximal one 1.1 times as wide as long, the distal one 1.7 times as long as wide and 1.7 times as long as proximal node; proximal stem equal in length to proximal node; distal stem 0.9 as long as distal node; three circumfila, the proximal on proximal node, its loops attaining basal half of proximal stem, middle at base of distal node, its loops attaining basal 0.6 of its node, the distal on distal portion of node, its loops attaining basal two-thirds of distal stem. Palpus (Fig. 7*c*) of four segments; proportions of segments 1.0:1.5:2.1:2.5 (one palp of holotype), first segment 1.5 times as long as wide, remaining segments successively narrower. Wing (Fig. 7*b*) 2.6 times as long as wide; R_1 ending in costa at basal 0.4; two sensory pores very close to the juncture as in figure; R_5 nearly straight but bent gently at distal fourth to meet and terminate costa at wing tip; M_{3+4} obsolete basally but visible to posterior margin of wing; Cu branching at level of junction of R_1 with costa; Cu_1 slightly curved, shorter than Cu; Cu_2 curved sharply at base and bent at nearly right angles to horizontal axis of wing. Each leg covered by very narrow scales which are longer and darker at ends of tibiae and tarsal segments 1 to 4; proportions of hind tarsal segments 1.0:6.5:4.0:3.0:1.8 (average of two legs on one paratype); four, mid, and hind claws (Fig. 7*d*) each bent sharply near base, nearly straight beyond, with a long delicate ventral tooth before the bend; each pulvillus 0.5 as long as claw. Terminalia (Fig. 7*a*) wider than long (viewed dorsally); basistyle stout, length 1.7 times greatest width; dististyle rather stout, length 3.0 times greatest width, basal third of outer margin bulging with a darker area as shown, apical third somewhat darkened and with a single tooth; style triangular, connected at base with inner surface of basistyle by a triangular extension, this continuous with a lateral footlike piece without a distinct termination in the mounts; style terminating proximally in two narrow extensions. Tenth sternite and tenth tergite about equal in length, both only very slightly shorter than style; tenth sternite truncate with rounded corners and very shallowly emarginate; tenth tergite deeply emarginate, the resulting lobes about 1.7 times as long as width at base.

Female.—Head, eye bridge, palpus, scape and pedicel as in male. Flagellum of 12 segments, the first two fused as in male, the distal segments becoming successively shorter with shorter stems, apical segment 2.0 times as long as wide, narrowing from distal half outward to rounded point; fifth flagellar segment (Fig. 7*f*) with proximal lobe 2.1 times as long as wide; distal stem 0.2 as long as proximal node; circumfila of two closely adhering rings, the basal encircling the node at basal 0.4, the distal at the extreme tip of node, the two rings connected on opposite sides of the segment. Wing and legs as in male. Ovipositor (Fig. 7*e*) about 1.5 times as long as abdomen, retractile, terminated by simple paired lobes.

Holotype.—♂, Butte County, Calif., 29-IX to 7-X, 1953, coll. Calif. Div. Forestry, reared from cones of *Abies magnifica*, Hopkins no. 32737. U.S.N.M. no. 63031.

Paratypes.—10 ♂♂, 29 ♀♀, same data as holotype. 5 ♂♂, 5 ♀♀ (CIS), remainder (USNM).

Additional material examined.—Oregon: 2 ♀♀; Ashland, Colestin. Reared from cones of *Abies concolor*, August 22 to October 23, 1914.

Discussion.—*Mycodiplosis conicola* is closely related by morphological characters to *M. alternata* Felt and *M. hudsoni* Felt, both of which have been recorded only from eastern United States, the former on *Podophyllum* and the latter on *Acer*. *M. conicola* and *M. coryloides* are the only species associated with the cones of western forest trees; *conicola* may be distinguished from *coryloides* by the shape of the proximal portion of the style and by the longer narrowed portions of the flagellar segments. See also discussion of *coryloides*, p. 56.

Mycodiplosis coryloides, n. sp.

Fig. 8, *a–e*, *g*

Male.—Shape of head from anterior view and width of eye bridge not visible in mounts available. Scape of antenna only very slightly longer than wide, widest slightly beyond the middle; pedicel subglobular, greatest width about 0.7 greatest width of scape; flagellum with terminal segments missing in all specimens, the segments not appreciably narrowed or shortened toward distal end of flagellum, first two flagellar segments fused, without a trace of a division between; fifth flagellar segment (Fig. 8*g*) with two nodes, the proximal one 0.8 as long as greatest width, which is at about middle; proximal stem 0.4 as long as proximal node; distal node 1.1 times as long as wide and 1.4 times as long as proximal node; distal stem 0.6 as long as distal node; three circumfila, one on proximal node and two on distal, the proximal one with loops attaining basal half of proximal stem, middle one with loops attaining apical two-thirds of distal node, distal one with loops barely exceeding apex of distal stem. Palpus (Fig. 8*c*) of four segments, proportions 1.0:2.2:3.0:3.8 (average of type series), first segment about as long as wide, second widest, third and fourth successively narrower. Wing (Fig. 8*b*) 2.2 times as long as wide; R_1 ending in costa at basal 0.4 with a single sensory pore just before the junction; R_5 nearly straight, bending slightly at distal fourth to meet and terminate costa at wing tip or just beyond; M_{3+4} obsolete basally, visible only from branching of Cu to near posterior margin of wing; Cu straight, branching at about the level of R_1-costa junction; Cu_1 slightly curved, shorter than Cu; Cu_2 curved and ending in posterior margin slightly beyond point of origin. Leg scales so narrow as to be almost hairlike; hind femur slightly longer than tibia; proportions of hind tarsal segments 1.0:7.3:4.2:3.0:1.8 (average of type series); claw (Fig. 8*d*) on each leg bent sharply near the base, nearly straight beyond; fore, mid and hind claws each with an inconspicuous ventral basal tooth; pulvillus 0.6 as long as claw. Terminalia (Fig. 8*a*) wider than long (viewed dorsally); basistyle stout, length 2.0 times greatest width, with a diagonal strip of sclerotization at base; dististyle 0.6 as long as basistyle, length 4.0 times greatest width, curved and somewhat tapered to tip, with a distal tooth as in illustration; style stout, narrow at extreme base but widening rapidly on basal fourth or third, where it forms lateral triangular arms attaching to inner margin of basistyle, gradually narrowing on distal fourth to a blunt, rounded tip; tenth sternite rounded-truncate distally with the mere suggestion of a median invagination; tenth tergite bilobed, the incisure attaining the base of the lateral arms of the style, each lobe rounded apically.

Female.—Head, palpus, scape and pedicel as in male. Flagellum of 12 segments, the first two fused without any indication of a division, segments becoming slightly shorter toward apex of flagellum, the terminal segment 2.0 times as long as wide, narrowed to a point from distal half outward; fifth flagellar segment with proximal node 2.1 times as long as wide; distal stem 0.1 as long as node; two closely adhering circumfila in the form of irregular rings which are connected to each other at opposite sides of the segment. Wings and legs as in male. Ovipositor (Fig. 8*e*) fleshy, retractile, length not measurable in available specimens, terminated by simple paired lobes.

Holotype.—♂, Butte County, Calif., 29-IX to 7-X, 1953, Calif. Div. Forestry, reared from cones of *Abies concolor*, Hopkins no. 32738f. U.S.N.M. no. 63082.

Paratypes.—3 ♂♂, 5 ♀♀ same data as holotype. One ♂, 2 ♀♀ paratypes (CIS), remainder (USNM).

Additional material examined.—CALIFORNIA; 1 ♂, 2 ♀♀; Plumas National Forest (Quincy). OREGON: 1 ♂; Jenny Creek. From cones of *Abies magnifica* and *Pseudotsuga menziesii*, October to November 26, 1930–1938.

Discussion.—The two new *Mycodiplosis* species discussed here, *conicola* and *coryloides*, are very closely related and are the only species of the genus associated with cones of Western forest trees. *M. coryloides* may be distinguished from *conicola* by the narrower style and the more slender dististyle, and from *Mycodiplosis coryli* Felt, to which it is also closely related, by the longer claws and wider style flanges. Adults of several species of this genus have been reared from mycophagous larvae, but it is not known whether the mycophagous habit is common to the genus as a whole.

Lestodiplosis taxiconis, n. sp.

Fig. 9, *a–d*, *f*, *g*

Male.—Head nearly round from anterior view; eye bridge 9 to 10 facets wide. Scape of antenna 1.25 times as long as wide, slightly narrower at base than at apex; pedicel subglobular, slightly wider than long, rounded at apex; flagellum of unknown number of segments, the first two completely fused, appearing as a single segment with four nodes; remaining segments progressively shorter, apical segment narrowed and rounded at apex; fifth flagellar segment (Fig. 9*g*) with two nodes, the proximal 0.55 as long as wide and separated from distal node by a stem 1.5 times as long as proximal node; distal node as long as wide at greatest width, also somewhat flask-shaped; distal stem equal in length to distal node; proximal node with a single circumfilum, loops of which nearly attain base of distal node; distal node with two circumfila, the proximal one very close to base of node and with loops nearly attaining greatest width of node; distal one situated very close to distal margin of node and with loops nearly attaining apex of distal stem. Palpus (Fig. 9*c*) of four segments proportions 1.0:2.6:2.6:3.1 (average of type series); first segment subsquare in outline, second and third slightly wider, fourth suboval and only very slightly wider than second and third. Wing (Fig. 9*b*) without markings, about two times as long as wide; R_1 ending in costa at basal 0.4; the suggestion of a crossvein, not distinctly connected with R_1, present near base of R_5; R_5 nearly straight for most of its length, meeting and terminating costa at wing tip; Cu straight, forked at outer 0.4; Cu_1 gently curved; Cu_2 likewise gently curved and terminating in posterior margin of wing just apicad of termination of R_1. Legs densely covered by very narrow scales; hind femur slightly longer than tibia; proportions of hind tarsal segments 1.0:5.6:2.4:1.3:1.0 (average of type series); fore, mid and hind claws (Fig. 9*d*) simple, not sharply curved; each pulvillus 0.8 as long as claw. Terminalia (Fig. 9*a*) longer than wide (viewed dorsally); basistyle slender, length nearly three times greatest width, with a distinct shoulder on inner dorsal margin at the middle; dististyle 0.5 as long as basistyle, 4.5 times as long as greatest width, swollen on basal fourth, remainder slender, slightly curved inwardly, only very slightly enlarged distally and with a distal slit; style nearly as long as basistyle, narrow proximally and expanding to its greatest width at proximal fourth where it is provided with inconspicuous lateral projections, thence gradually narrowing to tip which is very slightly expanded and truncate; tenth tergite bilobed, the bottom of the incision almost square, each lobe 1.5 times as long as wide and evenly rounded at tip; tenth sternite slightly shorter than tergite and considerably shorter than style, rounded at tip (not divided into lobes).

Female.—Head, eye bridge, palpus, scape, and pedicel as in male. Flagellar segments with single nodes, the first two completely fused; fifth flagellar segment with length of node 1.6 times the greatest width; distal stem 0.9 as long as node; circumfila not distinguishable in the poorly mounted specimen. Wing as in male. Hind tarsal segments missing; terminal abdominal segments fleshy; ovipositor not retractile.

Holotype.—♂, Colestin, Oreg., 30-VI-1914, J. E. Patterson, reared from cones of *Pseudotsuga taxifolia*, Hopkins no. 12535g. U.S.N.M. no. 63033.

Paratypes.—4♂♂, same data as holotype; 2♂♂ (CIS), remainder (USNM). Eleven ♂♂, 3♀♀, near Lamb's Mine, Ashland, Oreg., 17-II-1915, F. P. Keen and P. D. Sergent, reared from cones of *Pseudotsuga menziesii*, Hopkins no. 13209e-3 through e-8; 6♂♂, 1♀ (CIS) remainder (USNM).

Additional material examined.—1♂, 1♀, same data as Hopkins nos. 13209e-3 through e-8 (CIS). These specimens are badly damaged and have little value for comparative purposes.

Discussion.—Males of *Lestodiplosis taxiconis* may be distinguished at once from all other North American species of *Lestodiplosis* by the relatively short, narrowed portions (length 2.5 times width vs. length 3.5 times width) of the fifth flagellar segment, and by the fact that this species is associated with cones of Western forest trees.

Felt's (1921) key to the North American species of *Lestodiplosis*, based almost entirely on color and characters of the male antennae, is almost impossible to use for alcoholic or slide-mounted material. The genus needs extensive revision. Pritchard (1953) does not list the genus as occurring in California. In his key, *Lestodiplosis* runs to *Retinodiplosis* or to *Itonida*, from which it may be separated by the presence of a lobe on the inner surface of the basistyle (Fig. 9*a*).

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